

Remarks

Reconsideration is requested. Non-elected claims 11-14, 16-31, 35-40, 42-96, 98, 100-101, and 103-108 are canceled by this response without prejudice or disclaimer. Claims 1-6, 8-10, 15, 32-34, 41, 97, 99, and 102 are pending. Applicants reserve the right to pursue any of the non-elected claims in one or more separately filed divisional applications.

Applicants note that the office action summary sheet references claims 1-107 as being pending. As explained in Applicant's response filed on December 4, 2002, the numbering of claims 96-108 was believed to be correct, so that claims 1-6 and 8-108 were previously pending. In this regard, the Examiner's attention is drawn to the Article 11 amendment that was made during international proceedings, a copy of which accompanied the original application papers. That amendment made certain amendments to the claims and added additional claims. The Article 11 amendments are part of this U.S. national stage application.

Certain claims have been withdrawn from consideration. However, the claims that have been withdrawn is not clear. The office action summary sheet identifies claims 11-14, 16-31, 35-40, 42-95, 97, 99, 100 and 102-108 (sic) as having been withdrawn from consideration by the Examiner, with claims 1-10, 15, 32-34, 41, 96, 98 and 101 as being examined. Yet, page 2 of the office action identifies claims 11-14, 16-31, 35-40, 42-96, 98, 100-101 and 103-108 as having been withdrawn from consideration. Further, claims 97, 99 and 102 have been listed in the prior art rejections, despite the office action summary sheet indicating these claims as having been withdrawn.

For purposes of this response, Applicants will assume that claims 1-6, 8-10, 15, 32-34, 41, 97, 99 and 102 reflect the examined claims, and that all other claims have been withdrawn from consideration. Applicants request clarification of the withdrawn and examined claims with the next communication from the Examiner. In view of the confusion surrounding the status of the claims, Applicants request that the Examiner permit Applicants to re-enter any of the claims that have been canceled herein in the event that the clarification shows that the claims should not have been canceled.

Prior art rejections

Claims 1, 5-6, 8-10, 15, 97 and 99 are rejected under 35 USC 102(b) as being anticipated by Abel (US 3,811,749).

In addition, claims 2 and 4 are rejected under 35 USC 103(a) as being unpatentable over Abel in view of Cook (US 4,834,517).

In addition, claims 32-34, 41 and 102 are rejected under 35 USC 103(a) as being unpatentable over Abel in view of Willey (US 5,841,574).

Applicants respectfully traverse each of these rejections, and reconsideration is requested in view of the following.

Claims 1, 5-6, 8-10, 15, 97 and 99

Claim 1 is an independent claim, with claims 5-6 and 8-10 depending thereon.

Therefore, if claim 1 is patentable, claims 5-6 and 8-10 are patentable along with claim 1. Claim 15 is an independent claim, with claims 97 and 99 depending thereon. Therefore, if claim 15 is patentable, claims 97 and 99 are patentable along with claim 15.

Claim 1

Claim 1 recites a reflective optical device comprising two non-axisymmetric reflection surfaces for bringing light fluxes from an object into focus on an image surface, the two non-axisymmetric reflection surfaces being a first reflection surface and a second reflection surface, wherein the first and second reflection surfaces are disposed in this order in a direction in which the light fluxes travel. Claim 1 also recites that each of the first and second reflection surfaces is a free-form surface that does not have a rotational axis.

Abel does not teach or suggest at least these features. Abel discloses an optical apparatus that includes reflectors 18, 20 that are arranged eccentrically (Figures 1, 3 and 4). However, the reflectors 18, 20 constitute a part of an axisymmetric paraboloid, sharing a common optical axis 22 (col. 2, lines 31-34). As a result, the reflectors 18, 20 are not non-axisymmetric.

In addition, Abel discloses reflectors 42, 60, where the reflector 42 has an axisymmetric and aspherical surface defined by the equation $S = Dy^4 + Ey^6 + Fy^8 + Gy^{10}$ (col. 4, lines 64 to col. 5, line 2). In addition, the reflector 60 has a spherical reflection surface (col. 3, lines 57-58). As a result, the reflectors 42, 60 are not non-axisymmetric.

Further, Abel does not teach or suggest first and second reflection surfaces, each of which is a free-form surface that does not have a rotational axis.

For at least these reasons, claim 1 is not anticipated by Abel. Claims 5-6 and 8-10 depend from claim 1 and are patentable for the reasons given for claim 1 and need not be

separately distinguished. By not specifically addressing the rejection to the dependent claims, Applicants do not concede the propriety of the rejection or any statements made in the rejection.

Claim 15

Claim 15 recites a reflective optical device that includes a second reflection surface that is concave in a cross-sectional shape taken in the vicinity of its vertex along a plane containing vertices of the reflection surfaces, and is convex in a cross-sectional shape taken in a direction perpendicular to the plane.

Abel does not teach or suggest at least this feature. The reflectors 18, 20, 42 and 60 in Abel are concave both in the vertical and horizontal directions. However, Abel does not disclose a reflector that is convex in a cross-sectional shape taken in a direction perpendicular to the plane containing vertices of surfaces of the reflectors as claimed.

For at least these reasons, claim 15 is not anticipated by Abel. Claims 97 and 99 depend from claim 15 and are patentable for the reasons given for claim 15 and need not be separately distinguished. By not specifically addressing the rejection to the dependent claims, Applicants do not concede the propriety of the rejection or any statements made in the rejection.

Claims 2 and 4

Claims 2 and 4 depend from claim 1 and are patentable for the reasons given for claim 1 and need not be separately distinguished. By not specifically addressing the rejection to dependent claims 2 and 4, Applicants do not concede the propriety of the rejection or any statements made in the rejection. Applicants note that Cook does not remedy the deficiencies of Abel with respect to claim 1 discussed above.

Claims 32-34, 41 and 102

Claims 32-34 and 41 depend from claim 1 and are patentable for the reasons given for claim 1 and need not be separately distinguished. By not specifically addressing the rejection to dependent claims 32-34 and 41, Applicants do not concede the propriety of the rejection or any statements made in the rejection. Applicants note that Willey does not remedy the deficiencies of Abel with respect to claim 1 discussed above.

Claim 102 depends from claim 15 and is patentable for the reasons given for claim 15 and need not be separately distinguished. By not specifically addressing the rejection to dependent claim 102, Applicants do not concede the propriety of the rejection or any statements made in the rejection. Applicants note that Willey does not remedy the deficiencies of Abel with respect to claim 15 discussed above.

Applicants acknowledge the indication that claim 3 contains allowable subject matter. As discussed above, Applicants believe that all of the examined claims are patentable as well.

Conclusion

With the above amendments and remarks, Applicants believe that the claims now pending in this patent application are in a condition for immediate allowance. Favorable consideration is respectfully requested. If any further questions arise, the Examiner is welcome to contact Applicants' representative at the number listed below.

Respectfully Submitted,

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